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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,148	12/12/2001	Yeong-Taeg Kim	SAM2.0007	2503
23386	7590	12/28/2005		
MYERS DAWES ANDRAS & SHERMAN, LLP 19900 MACARTHUR BLVD., SUITE 1150 IRVINE, CA 92612				
			EXAMINER PERUNGAVOOR, SATHYANARAYA V	
			ART UNIT 2625	PAPER NUMBER

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/021,148	<b>Applicant(s)</b> KIM, YEONG-TAEG	
	<b>Examiner</b> Sath V. Perungavoor	<b>Art Unit</b> 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-9 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 3,4,10 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

[1] A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 22, 2005 has been entered.

### ***Claim Interpretations***

[2] Applicant has clarified the meaning of "boundary of an edge", as per request from the Examiner. Hence, the Examiner now interprets "boundary of an edge" to mean a sharp edge (i.e. a pixel with maxima or above threshold gradient).

Note: If the Examiner's interpretation is still inconsonant with the disclosure, Examiner respectfully requests the applicant(s) to *explicitly* define these terms either through remarks or claim amendments.

### ***Response to Arguments/Amendments***

[3] Presented arguments have been fully considered, but are rendered moot in view of the new ground(s) of rejection necessitated by amendment(s) initiated by the applicant(s).

[4] The indicated allowability of claim 2 is withdrawn in view of the newly discovered reference(s) to Lee et al. Rejections based on the newly cited reference(s) follow. Examiner apologizes for any inconvenience this may cause the applicant.

### ***Claim Rejections - 35 USC § 112***

[5] Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- Claim 14, describes the gain suppression function increases as probability of shoot increases. However, the specification enables for the gain suppression to decrease as the probability of shoot increases, see also  $\beta$  of claim 3. Examiner assumes this is a typo, because claim 14 as it states now would worsen the very problem the applicant intends to solve.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[6] Claims 1, 6-9 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheikh et al. ("Cheikh") [NPL document titled, "Directional-Rational Approach for Color Image Enhancement"].

Regarding claim 1, Cheikh discloses the following claim limitations:

A method for enhancing an image, which comprises [Figure 2]: obtaining a first image signal including pixel values [1 on Figure 2]; obtaining a high-pass image signal having high-frequency components of the first image signal [5 on Figure 2]; selecting edge pixel values representing a boundary of an edge in the first image [Page III-564, Column 2, Paragraph 1 and Equation 8:  $\Delta \rightarrow +\infty$  meets the limitation of boundary of edge because this condition exists when the gradient magnitude large, which indicates a sharp edge (i.e. boundary of an edge).]; for suppressing shoots, defining a gain suppressing function having attenuation coefficients to be multiplied with particular pixel values of the high-pass image signal corresponding in location to the edge pixel values [6 and 7 on Figure 2; Page III-564, Column 2, Equations 8 and 9]; multiplying the high-pass image signal by the gain suppressing function to obtain a result [6 on Figure 2]; and adding the result to the first image signal to obtain an enhanced image signal in which the shoots have been suppressed [2 on Figure 2].

The embodiment disclosed by Cheikh in figure 2 does not explicitly disclose the following claim limitations:

obtaining a positive non-zero weighting factor to control a degree of enhancement;  
 multiplying the high-pass image signal by the weighting factor to obtain a result;

However, another embodiment disclosed by Cheikh discloses the deficient claim limitations, as follows:

obtaining a positive non-zero weighting factor to control a degree of enhancement [6 on Figure 1:  $\lambda$ ]; multiplying the high-pass image signal by the weighting factor to obtain a result [7 on Figure 1];

It would have been obvious to one with ordinary skill in the art at the time of invention to combine the teachings of Cheikh's two embodiments and multiplying the high-pass image signal by the weighting factor and by the gain suppressing function, the motivation being to control the fraction of high pass image to be added to the input image [Page III-563, Column 2, Paragraph 1].

Regarding claim 6, Cheikh meets all the claim limitations, as follows:

The method according to claim 1, wherein the edge extends in a horizontal direction [Page III-564, Column 1, Paragraph 1:  $I(u_1, u_2)$ ].

Regarding claim 7, Cheikh meets all the claim limitations, as follows:

The method according to claim 1, wherein the edge extends in a vertical direction [Page III-564, Column 1, Paragraph 1:  $I(u_1, u_2)$ ].

Regarding claim 8, Cheikh meets all the claim limitations, as follows:

The method according to claim 1, wherein the step of obtaining the high-pass image signal includes filtering the first image signal [5 on Figure 2].

Regarding claim 9, Cheikh meets all the claim limitations, as follows:

The method according to claim 1, wherein the gain suppressing function inherently performs the step of selecting the edge pixel values [Page III-564, Column 2, Equations 8 and 9].

Regarding claim 13, Cheikh meets all the claim limitations, as follows:

The method according to claim 1 wherein the step of defining the gain suppressing function further includes the steps of defining the gain suppressing function having attenuation coefficients to be multiplied with particular pixel values of the high-pass image signal corresponding in location to the edge pixel values, wherein the gain suppressing function is based on the probability of shoot at the edge pixel values [Page III-564, Column 2, Paragraph 3, Item iii].

Regarding claim 14, Cheikh meets all the claim limitations, as follows:

The method according to claim 1 wherein the step of defining the gain suppressing function further includes the steps of defining the gain suppressing function having attenuation coefficients to be multiplied with particular pixel values of the high-pass image signal corresponding in location to the edge pixel values, wherein the gain suppressing function is based on the probability of shoot at the edge pixel values such that the gain suppression function increases as probability of shoot increases to reduce shoot [Page III-564, Column 2, Equations 8 and 9 and Figure 3 (red-lined plot)].

Regarding claim 15, Cheikh meets all the claim limitations, as follows:

The method of claim 1 wherein boundary of an edge is defined by independent boundary-indicating conditions [Page III-564, Column 2, Equations 8:  $\Delta \rightarrow +\infty$ ].

[7] Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cheikh in view of Lee et al. ("Lee") [NPL document titled, "Detecting Boundaries in a Vector Field"].

Regarding claim 2, Cheikh meets the claim limitations as set forth in the discussion for claim 1.

Cheikh does not explicitly disclose the following claim limitations:

The method according to claim 1, which comprises performing the selecting step by evaluating *two* independent boundary-indicating functions and concluding that a given one of the pixel values of the first image represents the boundary of the edge only if both of the two functions indicate that the given one of the pixel values is on the boundary.

However, in the same field of endeavor Lee discloses the deficient claim limitations, as follows:

The method according to claim 1, which comprises performing the selecting step by evaluating two independent boundary-indicating functions and concluding that a given one of the pixel values of the first image represents the boundary of the edge only if both of the two functions indicate that the given one of the pixel values is on the boundary [*Page 1183, Column 1, Section IV, Item 5*].

Cheikh and Lee are combinable because they are from same field of edge detection.

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Cheikh with Lee to select boundaries based on two functions, the motivation being to perform thresholding [*Page 1183, Column 1, Section IV, Item 5*].

### ***Allowable Subject Matter***



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[8] Claims 3, 4, 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

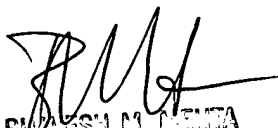
### ***Contact Information***


[9] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Bhavesh M. Mehta whose telephone number is (571) 272-7453, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dated: December 20, 2005

  
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